

IN THE CLAIMS

1. (Withdrawn) A finder for an image pickup device, which makes use of a variable hologram element using a polymer dispersed liquid crystal or a polymer stabilized liquid crystal.

2. (Withdrawn) A display for an image pickup device, which makes use of a variable hologram element using a polymer dispersed liquid crystal or a polymer stabilized liquid crystal.

3. (Withdrawn) Variable-focus glasses, which make use of a variable hologram element using a polymer dispersed liquid crystal or a polymer stabilized liquid crystal.

4. (Withdrawn) An optical pickup, which makes use of a variable hologram element using a polymer dispersed liquid crystal or a polymer stabilized liquid crystal.

5. (Withdrawn) An optical measuring device, which make use of a variable hologram element using a polymer dispersed liquid crystal or a polymer stabilized liquid crystal.

6. (Withdrawn) A decentration measuring device, which makes use of a variable hologram element using a polymer dispersed liquid crystal or a polymer stabilized liquid crystal.

7. (Currently Amended) A variable ~~hologram~~ optical element, comprising:
a liquid crystal, and
a photonic crystal having a two-dimensional or three-dimensional lattice structure,
wherein said liquid crystal layer and said photonic crystal are configured and arranged to converge or diverge light.

8. (Withdrawn) An endoscope, wherein an image is formed by a digital hologram.

9. (Withdrawn) A variable hologram element using a polymer dispersed liquid crystal or a polymer stabilized liquid crystal, wherein a substrate therefor has a lens or mirror action.

10. (Withdrawn) A variable hologram element using a polymer dispersed liquid crystal or a polymer stabilized liquid crystal, which meets at least one of conditions (1), (4), (8), (10) and (11).

11. (Withdrawn) A variable hologram device, wherein a plurality of variable hologram elements, each using a polymer dispersed liquid crystal or a polymer stabilized liquid crystal, are laminated together with a transparent electrode interposed therebetween.

12. (Withdrawn) A finder for an image pickup device, which makes use of a variable hologram element.

13. (Withdrawn) The finder for an image pickup device according to claim 12, which further includes a light source having a short half bandwidth.

14. (Withdrawn) The finder for an image pickup device according to claim 5, which further satisfies at least one of conditions (5) and (6).

15. (Withdrawn) A finder for a digital camera, which makes use of a variable hologram element.

16. (Withdrawn) A single-lens reflex, Galilean, Albada or Keplerian type finder, which makes use of a variable hologram element.

17. (Withdrawn) A wearable information device making use of a variable hologram element, which is used with a light source having a short half bandwidth.

18. (Withdrawn) A wearable information device making use of a variable hologram element, wherein said variable hologram element is used for an adapter or case.

19. (Withdrawn) A wearable information device making use of a variable hologram element, wherein said wearable information device may be used in the form of a head mount display and has functions of glasses and a display.

20. (Withdrawn) A display for an image pickup device, which makes use of a variable hologram element.

21. (Withdrawn) The display for an image pickup device according to claim 20, which further includes a light source having a short half bandwidth.

22. (Withdrawn) The display for an image pickup device according to claim 20, wherein said variable hologram element is used for an adapter or case.

23. (Withdrawn) Variable-focus glasses, which make use of a variable hologram element.

24. (Withdrawn) The variable-focus glasses according to claim 23, which further includes a light source having a short half bandwidth.

25. (Withdrawn) The variable-focus glasses according to claim 23, which are used with a light source having a short half bandwidth.

26. (Withdrawn) An optical pickup, which makes use of a variable hologram element.

27. (Withdrawn) An optical pickup for disks with varying thicknesses, which makes use of a variable hologram element.

28. (Withdrawn) The optical pickup according to claim 26 or 27, which is used with a light source having a short half bandwidth.

29. (Withdrawn) An optical measuring device, wherein a variable hologram element is used for optical path switching.

30. (Withdrawn) An optical measuring device, which makes use of a variable hologram element.

31. (Withdrawn) The optical measuring device according to claim 29 or 30, which is used with a light source having a short half bandwidth.

32. (Withdrawn) A decentration measuring device, wherein a variable hologram element is used for optical path switching.

33. (Withdrawn) A decentration measuring device, which makes use of a variable hologram element.

34. (Currently Amended) A variable ~~hologram~~ optical element, ~~which comprises~~ comprising:

a liquid crystal impregnated into interstitial voids in a photonic crystal having a two-dimensional or three-dimensional lattice structure,

wherein said liquid crystal layer and said photonic crystal are configured and arranged to converge or diverge light.

35. (Cancelled)

36. (Withdrawn) An endoscope, wherein an image is formed by a digital hologram.

37. (Withdrawn) The endoscope according to claim 36, which further satisfies condition (12).

38. (Withdrawn) The endoscope according to claim 36, wherein an image is formed by a digital hologram using infrared light.

39. (Withdrawn) The endoscope according to claim 38, wherein visible light is observable.

40. (Withdrawn) The endoscope according to claim 36, which further includes a trichromatic light source.

41. (Withdrawn) The endoscope according to claim 38, which further satisfies condition (13).

42. (Withdrawn) The endoscope according to any one of claims 36 to 41, which

further includes a half-silvered mirror prism.

43. (Withdrawn) A head mount display, which makes use of a variable hologram element and has functions of glasses and a display.

44. (Withdrawn) An optical measuring device, which makes use of a variable hologram element having an optical path switching function.

45. (Withdrawn) A device, wherein the hologram element according to any one of claims 12, 15, 16, 20, 23, 26, 27, 29, 30, 32 and 33 is constructed, using a polymer dispersed liquid crystal or a polymer stabilized liquid crystal.

46. (Currently Amended) The variable ~~hologram~~ optical element of claim 7, wherein any one of the following conditions are satisfied:

$$|n_p - n_o| < 0.15$$

$$0 \leq |\theta| < 30^\circ$$

$$0 \leq |\alpha_{\max}| < 40^\circ$$

$$n_L = wn_p + (1 - w)(2n_o + n_e) / 3$$

$$n_p = n_L$$

$$|n_p - n_L| < 0.15$$

where,

n_p is a refractive index of the polymer,

n_o is the refractive index along an axis perpendicular to the longitudinal axis of the liquid crystal molecule,

θ is the optical axis of the finder with respect to normal,

α_{\max} is the maximum value of angle of a light ray passing through the variable hologram with respect to normal,

n_L is the refractive index of the liquid crystal layer,

w is the volumetric proportion of the polymer in the liquid crystal layer,

n_e is the refractive index along the longitudinal axis of the liquid crystal molecule.

47. (Currently Amended) A display having a variable ~~hologram~~ optical element as set forth in claim 7.

48. (Currently Amended) Variable-focus glasses having a variable ~~hologram~~ optical element as set forth in claim 7.

49. (Currently Amended) A finder having a variable ~~hologram~~ optical element as set forth in claim 7.

50. (Currently Amended) An optical pickup having a variable ~~hologram~~ optical element as set forth in claim 7.

51. (Currently Amended) A measuring device having a variable ~~hologram~~ optical element as set forth in claim 7.

52. (Currently Amended) An optical device having a variable ~~hologram~~ optical element as set forth in claim 7.

53. (Currently Amended) A variable ~~hologram~~ optical element, ~~which comprises~~ comprising:

a variable refractive-index substance and a photonic crystal having a two-dimensional or three-dimensional lattice structure,

wherein said liquid crystal layer and said photonic crystal are configured and arranged to converge or diverge light.

54. (Currently Amended) A variable ~~hologram~~ optical element, ~~which comprises~~ comprising:

a variable refractive-index substance impregnated into interstitial voids in a photonic crystal having a two-dimensional or three-dimensional lattice structure,

wherein said liquid crystal layer and said photonic crystal are configured and arranged to converge or diverge light.